

THE FLORA OF GARDINERS ISLAND

EDWARD J. HEHRE, JR.

In 1639, an island bearing the Indian name of Manchonake (Isle of Death) was deeded to Lion Gardiner by King Charles I of Great Britain. This deed is important historically as it represents the first manorial grant in the colonies; moreover, it was a British grant in the Dutch colonial settlement of New Amsterdam. Gardiners Island, as it is now called, has remained in the possession of the Gardiner family through an unprecedented sixteen generations. Today, this manor stands alone—the sole surviving member of a once select group of estates. Covering an area of about 3400 acres, Gardiners Island lies between the north and south forks of eastern Long Island, New York (Lat.: $41^{\circ}03'$ - $41^{\circ}07'$ N; Long.: $72^{\circ}05'$ - $72^{\circ}08'$ W). It is the geographic boundary between Gardiners Bay to the west (beyond which lies Shelter Island and the entrance to Peconic Bay) and Block Island Sound to the east (Figure 1).

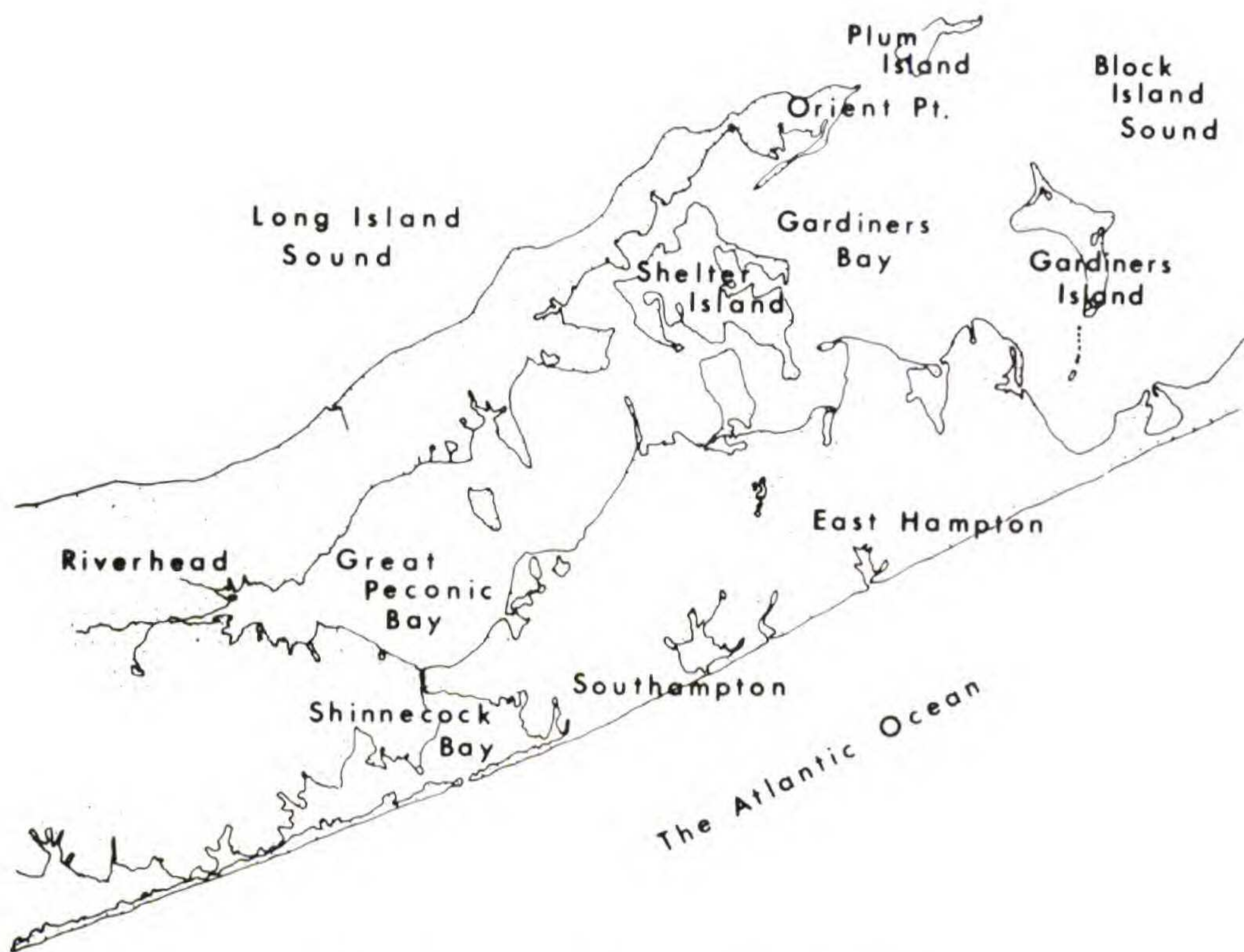


Figure 1. Map of eastern Long Island.

Gardiners Island is inhabited by only a few people, and its limited accessibility to the public has allowed much of the island to remain in its natural state. Although no rare or unusual species of plants have been found there, a large tract of virgin white oak, known as the Bostwick Forest, is without parallel in the Northeastern United States — a relict of the forests of pre-colonial Long Island. The island is a sanctuary for several species of birds, which are either absent or rare elsewhere on Long Island (e.g., Osprey, Oyster-catcher, American Egret, Wild Turkey, and Glossy Ibis). There also exists a large deer population, and while actual figures on its size are not known, the high browse-lines at the edges of woodlands plus the several individuals that die each winter indicate that the herd greatly exceeds the optimum number that the island can support.

Despite its long and interesting history, very little information about the plant life of Gardiners Island has been published. Burnham and Latham (1914–1925) compiled a checklist of the plants of Southold Town in which they included fifty-four taxa specifically from Gardiners Island.¹ Since their study was concerned primarily with Southold Town, their account of the plants of Gardiners Island merely represents several trips to the island and not a systematic study.

At present, 403 taxa have been recorded from Gardiners Island, including those listed by Burnham and Latham, Taylor (1922) and Peters (1973). Ten grow only in cultivation; 318 of the remaining 393 taxa are native; Appendix I includes all taxa recorded from the island. A checklist alone cannot do justice to the variety of interesting habitats encountered during this study. It seems appropriate, therefore, to describe the characteristic vegetation of these habitats, in an attempt to convey a more meaningful and more comprehensive picture of the flora of Gardiners Island. Voucher specimens are deposited in the Hodgdon Herbarium of the University of New Hampshire (NHA). With a few exceptions, the nomenclature used for angiosperms and gymnosperms follows that of *Gray's Manual of Botany* (8th ed., 1950). Nomenclature used for ferns follows Seymour (1969).

¹Gardiners Island lies south of the political boundary dividing the town of Southold on the North Fork and Easthampton on the South Fork. Thus, the island is part of Easthampton, not Southold.

Beaches. Although beaches extend around the entire perimeter of Gardiners Island, the largest and most well-developed ones are the barrier beaches associated with the major coastal ponds. Such broad expanses as those seen at Great Pond, Bostwick Creek and Tobaccot Pond have a conspicuous flora typical of the beaches of eastern Long Island. *Ammophila breviligulata* (beachgrass) is the dominant component; other members of this community often include *Lathyrus japonicus* var. *glaber*, *L. japonicus* var. *pellitus* and, to a lesser extent, *Strophostyles helvola* and *Opuntia humifusa* (the latter was found only at Bostwick Creek).

Perhaps the most unusual beach association on the island occurs at Cherry Hill, where there is a coarse gravel and cobble beach at the base of cliffs composed of glacial till. These cliffs rise to a height of nearly 100 feet. Although most of the species found there occur elsewhere on Gardiners Island, it is only at Cherry Hill that they form a distinct plant association (e.g., *Glaucium flavum*, *Nepeta cataria*, *Plantago major* var. *scopulorum*, *Oenothera biennis*, *Verbascum thapsus*, and *Teucrium canadense*).

There are numerous species encountered on beaches; many are major components of the beach flora in areas from which *Ammophila* is absent (e.g., *Cyperus grayii*, *Artemisia stelleriana*, *Arenaria peploides* var. *robusta*, *Atriplex patula* var. *hastata*, *Cakile edentula*, *Salsola kali*, *Euphorbia polygonifolia*, *Mollugo verticillata*, *Suaeda linearis*, *Triplasis purpurea*, *Chenopodium botrys*, *C. glaucum*, *Polygonum glaucum*, *P. aviculare* var. *littorale*, and *Solidago sempervirens*).

The cliffs to which I alluded earlier are found only on the northern regions of the island. They extend from Crow Head to Home Pond along the western shore; on the east, they extend from Bostwick Creek to Tobaccot Pond and are most prominent at Eastern Plain Point. (The highest point of land on Gardiners Island is Whale Hill on the northern shore of Eastern Plain Point. It is about 120 feet above sea level.) Due to the steep nature of the cliffs and the continual slumping of the unconsolidated glacial till, plants are abundant only locally, and there are but a few common species (e.g., *Solidago tenuifolia*, *Chrysopsis falcata*, *Lactuca scariola* f. *integrifolia*, *Erigeron pusillus*, *Gnaphalium obtusifolium*, *Equisetum arvense*, *Rumex acetosella*, *Cenchrus longispinus*, and *Plantago lanceolata*).

A discussion of shoreline vegetation on eastern Long Island would be incomplete without including *Phragmites communis* var. *berlandieri*. Although *Phragmites* is present on Gardiners Island, it certainly is not a conspicuous component of either the beach or marsh flora. It occurs sporadically, usually in small colonies on barrier beaches, parts of which are subject to occasional destruction during storms. Apparently, it colonizes open areas more readily than it competes with already existing vegetation. The only extensive colony of *Phragmites* on the island resulted directly from man's destruction of the original vegetation. Located adjacent to the boat basin in an area that was filled with dredge soil during construction of the harbor, rapid recolonization of the region by *Phragmites* led to the virtual exclusion of all other plants, reminiscent of a far-too-common sight along the shores and in the marshes of the South Fork of eastern Long Island.

Coastal Ponds with Salt Marshes. The salt marshes on Gardiners Island are among the finest tidal wetlands on eastern Long Island. They have remained undisturbed, having escaped the fate of the majority of our marshes (i.e., mosquito ditching, filling, and the subsequent invasion and replacement of vast segments by *Phragmites*). There are three large wetlands regions: Great Pond, at the southern tip of the island; Home Pond, the most extensive marsh with the greatest species diversity, located near the boat basin; and Cherry Hill Pond, at the extreme western point of the island.

Both Great Pond and Home Pond have permanent inlets into Gardiners Bay and thus support a diversified benthonic flora. Populations of marine algae predominate (e.g., *Cladophora* spp., *Enteromorpha* spp., *Codium fragile* ssp. *tomentosoides*, *Gracilaria foliifera*, *Polysiphonia harveyi*); the submergent angiosperm components are *Zostera marina* var. *stenophylla* and *Ruppia maritima* var. *longipes*. On Gardiners Island, *Zostera* is limited to small isolated patches in Great Pond. Large colonies of *Zostera* are very common, however, in Gardiners Bay and throughout Peconic Bay. *Ruppia*, on the other hand, is abundant in all coastal ponds on the island but, unlike *Zostera*, is not found beyond confined coastal ponds on eastern Long Island.

Cherry Hill Pond is permanently closed by a barrier beach (i.e., there is no inlet). Salinity readings of 30 ‰ (ppt), how-

ever, indicate a continual inundation of seawater over the low barrier beach. The dominant benthonic flora consists of *Cladophora* spp. and *Ruppia*.

The lower limit of the marshes is typically a zone of *Spartina alterniflora* with distinct zones of *S. patens* and *Distichlis spicata* occurring at slightly higher elevations. A narrow band of *Juncus gerardi* is present near the high water line. *Baccharis halimifolia* and *Iva frutescens* var. *oraria* are the major components of a dense shrub zone at and above the high water line at Great Pond and Home Pond. They have not been observed at Cherry Hill Pond, where this zone is dominated chiefly by *Myrica pensylvanica*.

There are several additional species that occur as common components of the salt marshes on Gardiners Island (e.g., *Salicornia europaea*, *S. bigelovii*, *S. virginica*, *Plantago oliganthos*, *Gerardia maritima*, *Pluchea purpurascens* var. *succulenta*, *Solidago sempervirens*, *Scirpus americanus*, *S. robustus*, *Limonium carolinianum*, and *Hibiscus palustris*). Some are found in all of the marshes on the island; others are more restricted in their distribution.

Additional wetlands surround three small ponds between the boat basin and Great Pond (Airport Pond, Gales Pond, Little Pond). They are completely contained by barrier beaches but are inundated regularly at high water. Salinities are generally in the range of 29–31 ‰ near the beaches, dropping sharply to less than 5 ‰ along the eastern shores where there are numerous freshwater springs. These areas of lower salinity support large stands of *Typha latifolia* and *Hibiscus palustris*. The dominant salt marsh grass is *Spartina alterniflora*.

In addition to ponds with well-developed salt marshes, there are two other coastal ponds, Bostwick Creek and Tobaccolot Pond. Neither has a permanent inlet although sea water inundates both, particularly during storms.

Bostwick Creek. Bostwick Creek is located at the northern end of the island. It was open to Gardiners Bay through a large inlet until 1967, when it was closed during a severe storm. Although it has remained closed since that time, the pond is inundated periodically (during extreme high tides and storms) over

the low barrier beach on its eastern shore. The salinity in Bostwick Creek remains a relatively constant 10–12 ‰.

The submergent vegetation consists mainly of *Ruppia maritima* var. *longipes* and the euryhaline green alga, *Enteromorpha intestinalis*. Along the shoreline, there are isolated patches of *Spartina alterniflora*, *S. patens*, and *Pluchea*, indicative of a once prevalent salt marsh.

There are two streams which empty into Bostwick Creek from the Bostwick Forest. They create marshy freshwater cul-de-sacs where one finds large stands of *Typha latifolia* and *Thelypteris palustris* var. *pubescens*. Other plants found in these freshwater regions of the pond include *Elatine minima* and *Sagittaria latifolia*. Overall, there are several species comprising the shoreline vegetation of Bostwick Creek (e.g., *Ptilimnium capillaceum*, *Teucrium canadense*, *Amorpha fruticosa*, *Galium palustre*, *Eleocharis acicularis*, *E. olivacea*, *Hibiscus palustris*, *Cyperus strigosus*, *C. grayii*, *C. diandrus*, and *C. filicinus*).

Tobaccolot Pond. Tobaccolot Pond is located on the eastern shore of Gardiners Island south of Eastern Plain Point. The original name was Tobacco Lot, signifying the area where tobacco was grown by the Indians prior to 1639. There is a deep channel at the northern end of the pond; it is at this point that a narrow section of barrier beach is often broken through during storms, allowing salt water into the pond. The principal freshwater sources are numerous springs and a single stream, Willow Brook. The combination of infrequent salt water intrusion, poor mixing when inundation does occur and the large volume of fresh water supplied to the pond accounts for its relatively low salinity (about 4 ‰).

The submergent vascular flora found here is slightly more diversified than in those ponds with higher salinities (e.g., *Ludwigia palustris* var. *americana*, *Potamogeton perfoliatus* var. *bupleuroides*, *P. pusillus* var. *tenuissimus*, *Elatine minima*, *Ruppia maritima* var. *longipes*). As in Bostwick Creek, there are marshy cul-de-sacs created by springs with large stands of *Typha latifolia* and *Thelypteris palustris* var. *pubescens*. Other conspicuous members of this community not seen at Bostwick Creek include *Scirpus cyperinus*, *Gratiola aurea* and *Lemna minor*.

A few of the shoreline plants found at Tobaccolot are widespread on the island (e.g., *Pluchea*, *Ptilimnium*, *Cyperus strigosus*, *C. grayii*, and *C. filicinus*). The dominant vegetation, however, is unique, with several species restricted to this locality (e.g., *Sesuvium maritimum*, *Rumex maritimus* var. *fueginus*, *Lechea maritima*, *Juncus militaris*, *Hypericum boreale*, *Euphorbia supina*, and *Gnaphalium uliginosum*). In addition to these plants, the upper border of Tobaccolot Pond supports the largest stand of *Hibiscus palustris* on the island. It extends completely around the perimeter of the pond and provides a spectacular display of color in late summer, when the plants are in full bloom. The pink-flowered *H. palustris* var. *palustris* is the more abundant form; there are a few patches of the white-flowered *H. palustris* var. *peckii* at the northwest end of the pond. This form was observed in only one other region on the island, at Little Pond.

The vegetation at the extreme southern end of Tobaccolot Pond was not examined due to the presence of a large Osprey colony. Several attempts were made to reach this area and each was met with strenuous vocal disapproval on the part of the inhabitants. Rather than incite additional anger and possible attack, the author thought it best to retreat.

Freshwater Ponds and Streams. Gardiners Island is replete with small ponds, marshy swales, springs, and a few streams. Since these regions are numerous, descriptions will include only the largest and most significant.

Garlick Pond. Garlick Pond² is situated near the boat basin, between the two roads leading from the harbor to the kennels and barns. It is shallow and muddy, with a conduit allowing for drainage into the harbor. The pond is named for Goodie (Good-wife) Garlick, the first woman accused of witchcraft on Long Island. She was tried for this crime in Connecticut in 1658. Released for lack of evidence, she came in the same year, by invitation from Lion Gardiner, to live on Gardiners Island near the pond which now bears her name. (In view of the origin of the name "Garlick" Pond, it is interesting that one finds field garlic, *Allium vineale*, growing along the banks of this pond

²Garlick Pond is also called Gaylor Hole on topographic maps.

and nowhere else on the island. It is conceivable, even probable, that Goodie Garlick was responsible for introducing this European plant to her home on Gardiners Island in the seventeenth century.)

Much of the shoreline of Garlick Pond is impenetrable, with dense populations of *Panicum clandestinum* and *Rubus frondosus*. There are only two areas of the pond that are accessible. 1) Large colonies of *Heracleum maximum* and *Scrophularia lanceolata* are found along the southwestern shore. Isolated clumps of *Iris versicolor* grow in shallow water near the shore, while the aforementioned *Allium vineale* occurs along the one open section of the pond border. 2) The northern section of the pond is marshy but can be reached, albeit with some difficulty. There are several interesting plants found here (e.g., *Echinochloa walteri*, *Impatiens capensis*, *Leersia oryzoides*, *Scirpus cyperinus* var. *pelius* f. *condensatus*, and *Eleocharis obtusa*). The vegetation on the western shore consists of a dense stand of *Hibiscus palustris*, which also occurs in tussocks throughout the pond.

Bostwick Dam. Bostwick Dam is a small pond created by a dam at the mouth of Upper Willow Brook, and one of the large cul-de-sacs in Bostwick Creek is fed by the outfall from this pond. The pond is accessible by a road through the Bostwick Forest, which passes over the dam. There is a dense shrub zone comprising the major shoreline vegetation (e.g., *Myrica pensylvanica*, *Ilex verticillata*, *Cephalanthus occidentalis*). There are very few submergent species; the common ones include *Elatine minima* and *Potamogeton pusillus* var. *tenuissimus*. A further note regarding Bostwick Dam: it is perhaps the largest Black-crowned Night Heron rookery on the island.

Canoe Place. Canoe Place is the major stream which flows through the Bostwick Forest. Like all the bodies of fresh water on Gardiners Island, it is spring-fed. This stream empties into Bostwick Creek, forming a broad expanse of marsh (the *Typha-Thelypteris* association previously mentioned).

Only two species (*Chrysosplenium americanum* and *Cardamine pensylvanica*) have been found growing partially or totally submerged in the stream, while the swampy borders provide for a diverse flora (e.g., *Acer rubrum*, *Nyssa sylvatica*, *Viola mack-*

loskyii ssp. *pallens*, *V. cucullata*, *Veratrum viride*, *Symplocarpus foetidus*, *Ranunculus repens*, *Polygonum sagittatum*, *P. arifolium* var. *pubescens*, *Hypericum mutilum*, *Onoclea sensibilis*, *Osmunda cinnamomea*, *Thelypteris novaboracensis*, *Triodia flava*, *Carex crinita* var. *brevicrinus*, *Lycopus virginicus*, and *Boehmeria cylindrica*).

Wolfies Hole and Willow Brook. Wolfies Hole is a large kettle pond northwest of Whale Hill. It is the largest inland pond on the island and provides the source for Willow Brook, which flows into Tobaccolot Pond. A thicket of *Decodon verticillata* creates an impenetrable barrier along most of the eastern shore. The remainder of the pond border is open, with dense stands of *Typha latifolia* and occasional clumps of *Osmunda regalis* var. *spectabilis* the most conspicuous plants along the muddy shores.

The floating and submergent vegetation in Wolfies Hole is sparse, although there are localized areas within the pond where aquatic plants are abundant (e.g., *Lemna minor*, *Spirodela polyrhiza*, *Myriophyllum humile* f. *capillaceum*, *Potamogeton diversifolius* var. *trichophyllum*). Other conspicuous plants consist of a few species of emergent aquatics (e.g., *Carex lurida*, *Juncus acuminatus*, *J. effusus* var. *solutus*, and *Eleocharis smallii*). There is a single large tree of *Liriodendron tulipifera* growing at the edge of the pond. As this is the only tulip tree on Gardiners Island, and as there is no indication that it was planted here, it may be the lone surviving member of a native species that has virtually disappeared from eastern Long Island.

Willow Brook is an intermittent stream that is little more than a muddy ditch during the summer. However, a dam constructed at the mouth of the stream as it enters Tobaccolot Pond has created a small pond and marsh. Among the several species of plants found along Willow Brook, the most common are *Myosotis laxa* and eight species of *Carex*. The marshy section of the pond is almost exclusively a mixture of *Rumex verticillata* and *Scirpus cyperinus*. Aquatic vegetation is sparse, although there is one colony of *Pontederia cordata* covering a large area near the dam. Other aquatic plants include *Lemna*, *Spirodela*, *Najas flexilis* and *Potamogeton pusillus* var. *tenuissimus*. The dominant shoreline plant is *Decodon verticillata*.

Below the dam, along the swampy western border of Tobac-

colot Pond, there is a thicket of *Alnus serrulata* f. *novaboracensis* and a few large trees of *Salix nigra*; neither of the two species has been seen elsewhere on the island. Other common plants in this region include *Bidens cernua* and *Myosotis laxa*.

Casey Pond. Casey Pond is a small kettlehole at the western edge of Rogers Woods. There are a few species of aquatic plants found only in this pond (e.g., *Proserpinaca palustris*, *Callitriche verna*, *Hypericum boreale* f. *callitrichoides*). The dominant emergent aquatic plant is *Juncus effusus* var. *costulatus*; there are also several patches of *Eleocharis tenuis*.

Bostwick Forest. The Bostwick Forest extends over most of the northern sector of Gardiners Island; it is a large tract of virgin timber whose principal components include *Quercus alba*, *Q. velutina*, *Carya ovalis* and *C. glabra*. The white oak (*Q. alba*) is the most common tree in the Bostwick Forest. It also attains the greatest size; many are close to 100 feet in height and the largest one has a d.b.h. of over five feet. There are several other species of trees comprising minor constituents of the forest (e.g., *Carya tomentosa*, *Quercus marilandica*, *Betula lenta*, *B. populifolia*, *Ostrya virginiana*, *Cornus florida*, and *Fagus grandifolia*).

The forest borders above the salt marsh at Home Pond are characterized by *Quercus stellata* and *Nyssa sylvatica*. *Nyssa* is also found in swampy regions of the Bostwick Forest with *Acer rubrum*. Two species of trees rarely seen outside of cultivation on eastern Long Island can be found along roads in the forest. Young seedlings of both *Paulownia tomentosa* and *Acer pseudo-platanus* indicate successful naturalization.

There is an obvious absence of young oak seedlings in the Bostwick Forest. The primary reason for their absence is equally obvious: the dominant understory vegetation consists of *Smilax rotundifolia*, whose dense stands, six feet or more in height, extend throughout the forest. *Smilax* allows for little else to grow and renders most of the forest impenetrable. It is also an actively climbing plant and, with *Toxicodendron radicans*, often forms a dense canopy over the tallest trees.

Vitis labrusca, another plant which quickly colonizes open areas, is more restricted in its distribution within the forest than *Smilax*. It is found primarily (but not exclusively) about the open borders

of the woods. This does not imply that *Smilax* is more abundant than *Vitis* on Gardiners Island. There are dense colonies of *Vitis* over many regions of the island; *Smilax*, although not restricted to the Bostwick Forest, grows most abundantly there. *Vitis* is also capable of overtopping large trees (it is occasionally seen encroaching on the forest trees) but it seems to thrive where the vegetation is low and shrubby.

The large populations of *Smilax rotundifolia* and *Vitis labrusca* have eliminated most other understory vegetation from a large portion of the Bostwick Forest. A few species of small trees and shrubs are present in limited numbers (e.g., *Celastrus orbiculatus*, *Crataegus crus-galli*, *Lindera benzoin*, *Sassafras albidum*, *Gaylussacia baccata*, *Vaccinium corymbosum*, *V. angustifolium* var. *laevifolium*, *Rhus typhina*, *Viburnum recognitum*, and *Sambucus canadensis*). For the same reason, very few herbaceous plants grow in the Bostwick Forest; many of those that do are found along the roadways (e.g., *Poa pratensis*, *Aster* spp., *Rubus frondosus*, *R. phoenicolasius*, *Asclepias purpurascens*, *Solidago rugosa*, *Tovara virginiana*, *Geranium maculatum*). One exception is a large glade near Canoe Place where there is a dense stand of *Thelypteris novaboracensis* and *Triodia flava*.

Rogers Woods. Rogers Woods extends from the Airport Road south of the boat basin, eastward to the western shore of Tobacco Pond. It is essentially a young oak-hickory woods (e.g., *Quercus alba*, *Q. velutina*, *Carya glabra*, and *C. ovalis*). Some of the other trees and shrubs found in this region include *Acer rubrum*, *Celtis occidentalis*, *Hamamelis virginiana* and *Amelanchier laevis*. *Smilax rotundifolia* is a common understory plant in dry areas, but it is not as dense nor as extensive as in the Bostwick Forest.

A large part of this wooded area consists of swales, which are usually muddy and occasionally have standing water. *Acer rubrum* is the most common tree in these wet swales; the one small grove of *Hamamelis* seen on the island also seems to prefer this habitat. On the western edge of Rogers Woods, in areas of standing water and on muddy shores, a few unusual plants occur in large numbers (e.g., *Hottonia inflata*, *Riccia fluitans* and *Ricciocarpus natans*). The most common trees around the perimeter of this woods are *Prunus serotina* and *Robinia pseudo-acacia*. There is a small stand of young *Ailanthus altissima* at one edge of the woods; this species was not seen elsewhere on the island.

Fields and Roads. There are several hundred acres of fields on Gardiners Island. Most of this land was cultivated during colonial times when the island was a self-sustaining community. The most extensive fields occur on the southern half of the island between Home Pond and Great Pond, but they are also prevalent in the vicinity of Cherry Hill. Many are mowed on a regular basis, thereby maintaining the grassland condition. Those that are not mowed show a secondary invasion of shrubs and small trees.

There are several common species of grasses in these field communities (e.g., *Andropogon scoparius*, *Echinochloa crusgalli*, *Holcus lanatus*, *Paspalum laeve* var. *pilosum*, *Poa pratensis*, *Setaria glauca*, and *Vulpia octoflora* var. *tenella*). Some are restricted to one or two localities, while others are more widespread and occur in most fields on the island.

There are several other herbaceous plants common in the fields on Gardiners Island. The following list includes only those that are most conspicuous:

<i>Achillea millefolium</i>	<i>Potentilla canadensis</i>
<i>Asclepias syriaca</i>	<i>Pycnanthemum muticum</i>
<i>A. tuberosa</i>	<i>P. tenuifolium</i>
<i>Chrysanthemum leucanthemum</i>	<i>Ranunculus bulbosus</i>
var. <i>pinnatifidum</i>	<i>Rubus enslenii</i>
<i>Cirsium altissimum</i>	<i>Rudbeckia hirta</i>
<i>C. discolor</i>	<i>Satureja vulgaris</i> var. <i>neogaea</i>
<i>C. horridulum</i>	<i>Sisyrinchium atlanticum</i>
<i>C. pumilum</i>	<i>S. montanum</i> var. <i>crebrum</i>
<i>Eupatorium hyssopifolium</i>	<i>Solanum caroliniense</i>
<i>Hypericum perforatum</i>	<i>Trifolium pratense</i>
<i>Linaria vulgaris</i>	<i>Veronica serpyllifolia</i>
<i>Onopordum acanthium</i>	<i>V. tenella</i>
<i>Ornithogalum nutans</i>	

In addition, a few plants of *Habenaria lacera* were seen in a field near the boat basin. This is the only orchid encountered on Gardiners Island during this study, although two other species (*Habenaria psychodes* and *H. clavellata*) were reported by Burnham and Latham (1917). These colonies have not as yet been rediscovered.

In fields where secondary succession has been allowed to proceed normally, one finds several species of woody plants (e.g., *Myrica pensylvanica*, *Rhus copallina*, *Prunus maritima*, *P. serotina*, *Rosa eglanteria*, *R. virginiana*, *Vitis labrusca*, and *Robinia pseudo-acacia*). *Robinia* and *Prunus serotina* are the most common woody plants along stone walls and roadsides.

There are numerous roadside weeds on the island. Some are conspicuous members of other associations, particularly fields; others are common only along the many dirt roads that traverse the island (e.g., *Taraxacum officinale*, *Plantago aristata*, *P. lanceolata*, *Cichorium intybus*, *Eragrostis cilianensis*, *E. pectinacea*, *Helenium flexuosum*, *Juncus greenei*, *J. tenuis*, *Matricaria matricarioides*, *Linaria canadensis*, *Trifolium repens*, and *Panicum oligosanthos* var. *scribnerianum*).

Other Notes on the Vegetation. Aside from a few small and inconspicuous plants of *Juniperus communis* and *J. virginiana*, there are no members of the Coniferales growing outside of cultivation on Gardiners Island. There are a few large trees of *Pinus strobus* planted at the southwest edge of the Bostwick Forest; a single tree of *Larix kaempferi* grows in the cemetery; and there are large stands of *Picea pungens* and *Pinus resinosa* south of the boat basin on the western shore, which were planted in the 1930's.

ACKNOWLEDGMENTS

I am sincerely grateful to Mr. Robert D. L. Gardiner, sixteenth Lord of the Manor of Gardiners Island, for his generosity in affording me the opportunity to study the flora of Gardiners Island, and for supplying much of the historical data concerning the island. The following people also deserve recognition for their assistance: Mr. Jock Mackay, caretaker of Gardiners Island, and his grandson, Brian, for their courteous hospitality during my frequent visits to the island, and for their help in locating several interesting and unusual areas during this study; Dr. H. M. Reisman and Mr. William Nicol, whose studies on the fishes and sponges of the island allowed for closer scrutiny of the vegetation in and around the coastal ponds; Mr. Nicol also provided an essential ingredient to this study — his boat was our source of transportation to and from the island; Mr. Bruce Chappell, for supplying the line drawing; the late Dr. A. R. Hodgdon, for his valuable assistance in the identification of several taxa and for his helpful criticism of the manuscript; Mr. Chris McKeever, for his assistance on several collecting trips; and to Dr. Edward J. Hehre, for his critical review of the manuscript.

LITERATURE CITED

- BURNHAM, S. H., & R. A. LATHAM. 1914. The flora of the town of Southold, Long Island and Gardiners Island, New York. *Torreyia* **14**: 229-254.
- & ———. 1917. *Ibid.*, 1st supplementary paper. *Ibid.* **17**: 120-122.
- & ———. 1921. *Ibid.*, 2nd supplementary paper. *Ibid.* **21**: 28-33.
- & ———. 1923. *Ibid.*, 3rd supplementary paper. *Ibid.* **23**: 27-30.
- & ———. 1924. *Ibid.*, 4th supplementary paper. *Ibid.* **24**: 30-32.
- & ———. 1925. *Ibid.*, 5th supplementary paper. *Ibid.* **25**: 80-83.
- FERNALD, M. L. 1950. Gray's manual of botany, 8th ed. American Book Co., 1632 pp.
- HAYNES, R. R. 1974. A revision of the North American *Potamogeton* subsection *Pusilli* (Potamogetonaceae). *Rhodora* **76**: 564-649.
- PETERS, G. H. 1973. Trees of Long Island. Long Island Horticultural Soc., Publ. 3.
- SEYMOUR, F. C. 1969. The flora of New England. C. E. Tuttle Co., Inc., Tokyo, Japan. 596 pp.
- TAYLOR, N. 1922. The forests and some big trees of Long Island. Brooklyn Botanic Garden leaflet. Series X, No. 8.

35 MAIN STREET
SOUTH BERWICK
MAINE 03908

APPENDIX I. ANNOTATED CHECKLIST

Equisetaceae

1. *Equisetum arvense* L.

Osmundaceae

2. *Osmunda cinnamomea* L.
3. *O. regalis* L. var. *spectabilis* (Willd.) Gray

Polypodiaceae

4. *Dryopteris spinulosa* (O. F. Muell.) Watt
5. *Onoclea sensibilis* L.
6. ¹*Thelypteris hexagonoptera* (Michx.) Weather.
7. *T. novaboracensis* (L.) Nieuwl.
8. *T. palustris* (Salisbury) Schott var. *pubescens* (Lawson) Fern.
9. *T. simulata* (Davenp.) Nieuwl.
10. *Woodwardia areolata* (L.) Moore

¹Burnham & Latham records; not observed in this study.

²Introduced.

³In cultivation only.

⁴Burnham & Latham records; also observed in this study.

⁵Recorded by Taylor; not observed in this study.

Pinaceae

- ^{2,3} *Larix kaempferi* Sarg.
- ³ *Picea pungens* Engelm.
- ³ *Pinus resinosa* Ait.
- ³ *P. strobus* L.

Cupressaceae

- 11. *Juniperus communis* L.
- 12. *J. virginiana* L.

Typhaceae

- 13. *Typha angustifolia* L.
- 14. *T. latifolia* L.

Sparganiaceae

- 15. ¹*Sparganium androcladum* (Engelm.) Morong
- 16. ¹*S. eurycarpum* Engelm.

Zosteraceae

- 17. ⁴*Potamogeton diversifolius* Raf. var. *trichophyllus* Morong
- 18. *P. perfoliatus* L. var. *bupleuroides* (Fern.) Farw.
- 19. *P. pusillus* L. var. *tenuissimus* Mert. & Koch
- 20. *Ruppia maritima* L. var. *longipes* Hagstr.
- 21. ¹*Zannichellia palustris* L.
- 22. *Zostera marina* L. var. *stenophylla* Aschers. & Graebn.

Najadaceae

- 23. *Najas flexilis* (Willd.) Rostk. & Schmidt

Alismataceae

- 24. *Sagittaria latifolia* Willd.

Gramineae

FESTUCEAE

- 25. ²*Bromus tectorum* L.
- 26. ²*Dactylis glomerata* L. var. *ciliata* Peterm.
- 27. ²*D. glomerata* L. var. *detonsa* Fries
- 28. *Distichlis spicata* (L.) Greene
- 29. ²*Eragrostis cilianensis* (All.) Mosher
- 30. *E. pectinacea* (Michx.) Nees
- 31. *E. spectabilis* (Pursh) Steud. var. *sparsihirsuta* Farw.
- 32. *Festuca rubra* L.
- 33. *Glyceria striata* (Lam.) Hitchc.
- 34. *Phragmites communis* Trin. var. *berlandieri* (Fourn.) Fern.
- 35. ²*Poa compressa* L.
- 36. *P. pratensis* L.
- 37. *Triodia flava* (L.) Smythe
- 38. *Triplasis purpurea* (Walt.) Chapm.
- 39. *Vulpia octoflora* (Walt.) Rydb. var. *tenella* (Willd.) Fern.

Gramineae (continued)

HORDEAE

40. *Agropyron repens* (L.) Beauv.
41. ⁴*Elymus villosus* Muhl.
42. *E. virginicus* L. var. *jejunos* (Ramaley) Bush

AVENEAE

43. ²*Holcus lanatus* L.

AGROSTIDEAE

44. *Agrostis stolonifera* L. var. *palustris* (Huds.) Farw.
45. *A. hyemalis* (Walt.) BSP.
46. *A. scabra* Willd.
47. *Ammophila breviligulata* Fern.
48. ¹*Aristida purpurascens* Poir.
49. ²*Phleum pratense* L.

CHLORIDEAE

50. *Spartina alterniflora* Loisel.
51. *S.* × *caespitosa* A. A. Eat.
52. *S. patens* (Ait.) Muhl.
53. *S. pectinata* Link

PHALARIDEAE

54. ²*Anthoxanthum odoratum* L.

ORYZEAE

55. *Leersia oryzoides* (L.) Sw.

PANICEAE

56. *Cenchrus longispinus* (Hack.) Fern.
57. ²*Digitaria sanguinalis* (L.) Scop.
58. ²*Echinochloa crusgalli* (L.) Beauv.
59. *E. walteri* (Pursh) Nash
60. *Panicum capillare* L.
61. *P. clandestinum* L.
62. *P. lanuginosum* Ell. var. *fasciculatum* (Torr.) Fern.
63. *P. lanuginosum* Ell. var. *septentrionale* Fern.
64. *P. oligoanthes* Schultes var. *scribnerianum* (Nash) Fern.
65. *P. virgatum* L. var. *spissum* Linder
66. *Paspalum laeve* Michx. var. *pilosum* Scribn.
67. ²*Setaria glauca* (L.) Beauv.

ANDROPOGONEAE

68. *Andropogon gerardi* Vitman
69. *A. scoparius* Michx.

MAYDEAE

70. *Tripsacum dactyloides* L.

Cyperaceae

71. *Bulbostylis capillaris* (L.) C. B. Clarke
72. *Carex annectens* Bickn.
73. *C. canescens* L.
74. *C. crinita* Lam. var. *brevicrinus* Fern.
75. *C. cristatella* Britt.
76. *C. debilis* Michx.
77. *C. digitalis* Willd.
78. *C. hormathodes* Fern.
79. *C. laevivaginata* (Kukenth.) Mackenz.
80. *C. lurida* Wahlenb.
81. *C. muhlenbergii* Schkuhr
82. ¹*C. retroflexa* Muhl.
83. *C. scoparia* Schkuhr
84. *C. stipata* Muhl.
85. *C. swanii* (Fern.) Mackenz.

Cyperaceae (continued)

86. *C. vulpinoidea* Michx.
87. *Cyperus diandrus* Torr.
88. *C. filicinus* Vahl
89. *C. filiculmis* Vahl var. *macilentus* Fern.
90. *C. grayii* Torr.
91. *C. strigosus* L.
92. ⁴*Eleocharis acicularis* (L.) R. & S.
93. *E. obtusa* (Willd.) Schultes
94. *E. olivacea* Torr.
95. *E. smallii* Britt.
96. *E. tenuis* (Willd.) Schultes
97. *Scirpus americanus* Pers.
98. *S. cyperinus* (L.) Kunth
99. *S. cyperinus* (L.) Kunth var. *pelius* Fern. f. *condensatus* (Fern.) S. F. Blake
100. *S. robustus* Pursh

Araceae

101. *Arisaema triphyllum* (L.) Schott
102. *Symplocarpus foetidus* (L.) Nutt.

Lemnaceae

103. *Lemna minor* L.
104. *Spirodela polyrhiza* (L.) Schleid.

Pontederiaceae

105. *Pontederia cordata* L.

Juncaceae

106. *Juncus acuminatus* Michx.
107. *J. brevicaudatus* (Engelm.) Fern.

- 108. *J. effusus* L. var. *costulatus* Fern.
- 109. *J. effusus* L. var. *solutus* Fern. & Wieg.
- 110. *J. gerardi* Loisel.
- 111. *J. greenei* Oakes
- 112. *J. militaris* Bigel.
- 113. ⁴*J. tenuis* Willd.

Liliaceae

- 114. ²*Allium vineale* L.
- 115. ²*Asparagus officinalis* L.
- 116. *Maianthemum canadense* Desf.
- 117. ²*Ornithogalum nutans* L.
- 118. *Smilax rotundifolia* L.
- 119. *Uvularia sessilifolia* L.
- 120. ⁴*Veratrum viride* Ait.
- 121. *Yucca filamentosa* L.

Dioscoreaceae

- 122. ¹*Dioscorea villosa* L.

Iridaceae

- 123. *Iris versicolor* L.
- 124. *Sisyrinchium atlanticum* Bickn.
- 125. *S. montanum* Greene var. *crebrum* Fern.

Orchidaceae

- 126. ¹*Habenaria clavellata* (Michx.) Spreng.
- 127. *H. lacera* (Michx.) Lodd.
- 128. ¹*H. psychodes* (L.) Spreng.

Salicaceae

- 129. *Salix nigra* Marsh.

Myricaceae

- 130. *Myrica pensylvanica* Loisel.

Juglandaceae

- 131. *Carya glabra* (Mill.) Sweet
- 132. *C. ovalis* (Wang.) Sarg.
- 133. ¹*C. ovata* (Mill.) K. Koch
- 134. *C. tomentosa* Nutt.
- ³*Juglans nigra* L.

Corylaceae

- 135. *Alnus serrulata* (Ait.) Willd. f. *novaboracensis* (Britt.) Fern.
- 136. ⁵*Betula allegheniensis* Britt.
- 137. *B. lenta* L.
- 138. ⁵*B. nigra* L.
- 139. *B. populifolia* Marsh.
- 140. *Ostrya virginiana* (Mill.) K. Koch

Fagaceae

- 141. *Fagus grandifolia* Ehrh.
^{2,3}*F. sylvatica* L. var. *purpurea* Ait.
- 142. *Quercus alba* L.
- 143. *Q. marilandica* Muenchh.
- 144. *Q. stellata* Wang.
- 145. *Q. velutina* Lam.

Ulmaceae

- 146. ⁴*Celtis occidentalis* L.
- 147. ¹*Ulmus americana* L.
^{2,3}*U. procera* Salisb.

Moraceae

- 148. ¹*Morus rubra* L.

Urticaceae

- 149. *Boehmeria cylindrica* (L.) Sw.
- 150. *Pilea pumila* (L.) Gray
- 151. ^{1, 2}*Urtica urens* L.

Polygonaceae

- 152. *Polygonella articulata* (L.) Meisn.
- 153. *Polygonum arifolium* L. var. *pubescens* (Keller) Fern.
- 154. *P. aviculare* L. var. *littorale* (Link) W. D. J. Koch
- 155. ²*P. convolvulus* L.
- 156. ²*P. dubium* Stein
- 157. ⁴*P. glaucum* Nutt.
- 158. *P. hydropiper* L.
- 159. *P. lapathifolium* L.
- 160. *P. pennsylvanicum* L.
- 161. ⁴*P. sagittatum* L.
- 162. ²*Rumex acetosella* L.
- 163. *R. maritimus* L. var. *fueginus* (Phil.) Dusen
- 164. *R. orbiculatus* Gray
- 165. *R. verticillatus* L.
- 166. ⁴*Tovara virginiana* (L.) Raf.

Chenopodiaceae

- 167. *Atriplex patula* L. var. *hastata* (L.) Gray
- 168. ²*Chenopodium ambrosioides* L.
- 169. ²*C. botrys* L.
- 170. ²*C. glaucum* L.
- 171. ²*C. lanceolatum* Muhl.
- 172. *Salicornia bigelovii* Torr.
- 173. *S. europaea* L.
- 174. *S. virginica* L.
- 175. *Salsola kali* L.
- 176. *Suaeda linearis* (Ell.) Moq.

Amaranthaceae

- 177.
- ²
- Amaranthus retroflexus*
- L.

Phytolaccaceae

- 178.
- Phytolacca americana*
- L.

Aizoaceae

- 179.
- ²
- Mollugo verticillata*
- L.
-
- 180.
- ⁴
- Sesuvium maritimum*
- (Walt.) BSP.

Portulacaceae

- 181.
- ²
- Portulaca oleracea*
- L.

Caryophyllaceae

- 182.
- Arenaria peploides*
- L. var.
- robusta*
- Fern.
-
- 183.
- ²
- Cerastium vulgatum*
- L.
-
- 184.
- ²
- Dianthus armeria*
- L.
-
- 185.
- ²
- Silene cucubalus*
- Wibel
-
- 186.
- Spergularia marina*
- (L.) Griseb.

Ranunculaceae

- 187.
- ²
- Ranunculus bulbosus*
- L.
-
- 188.
- ^{2,4}
- R. repens*
- L.

Berberidaceae

- 189.
- ²
- Berberis thunbergii*
- DC.
-
- 190.
- ²
- B. vulgaris*
- L.

Magnoliaceae

- 191.
- Liriodendron tulipifera*
- L.

Lauraceae

- 192.
- ⁴
- Lindera benzoin*
- (L.) Blume
-
- 193.
- Sassafras albidum*
- (Nutt.) Nees

Papaveraceae

- 194.
- ^{2,4}
- Glaucium flavum*
- Crantz

Cruciferae

- 195.
- ²
- Brassica nigra*
- (L.) Koch
-
- 196.
- Cakile edentula*
- (Bigel.) Hook.
-
- 197.
- ²
- Capsella bursa-pastoris*
- (L.) Medic.
-
- 198.
- Cardamine pensylvanica*
- Muhl.
-
- 199.
- Lepidium virginicum*
- L.

Saxifragaceae

- 200.
- ⁴
- Chrysosplenium americanum*
- Schwein.

Hamamelidaceae

- 201.
- ⁴
- Hamamelis virginiana*
- L.

Platanaceae

- ³
- Platanus occidentalis*
- L.

Rosaceae

POMEAE

- 202. *Amelanchier laevis* Wieg.
- 203. ¹*Crataegus arnoldiana* Sarg.
- 204. *C. crus-galli* L.
- 205. ¹*C. intricata* Lange
- 206. *C. macrosperma* Ashe
- 207. ²*Pyrus communis* L.

POTENTILLEAE

- 208. *Fragaria virginiana* Duchesne
- 209. *Geum canadense* Jacq. var. *camporum* (Rydb.) Fern. & Weather.
- 210. ¹*Potentilla anserina* L.
- 211. *P. anserina* L. var. *groenlandica* Tratt.
- 212. *P. canadensis* L.
- 213. ²*P. recta* L.

RUBEAE

- 214. ²*Rubus phoenicolasius* Maxim.
- 215. *R. enslenii* Tratt.
- 216. *R. frondosus* Bigel.

POTERIEAE

- 217. *Agrimonia gyrosepala* Wallr.

ROSEAE

- 218. ²*Rosa eglanteria* L.
- 219. ²*R. multiflora* Thunb.
- 220. ²*R. rugosa* Thunb.
- 221. *R. virginiana* Mill.

PRUNEAE

- 222. ⁴*Prunus maritima* Marsh.
- 223. *P. serotina* Ehrh.

Leguminosae

- 224. *Amorpha fruticosa* L.
- 225. *Amphicarpa bracteata* (L.) Fern.
- 226. ¹*Desmodium canescens* (L.) DC.
- 227. *Lathyrus japonicus* Willd. var. *glaber* (Ser.) Fern.
- 228. *L. japonicus* Willd. var. *pellitus* Fern.
- 229. ²*Lotus corniculatus* L.
- 230. *Robinia pseudo-acacia* L.
- 231. *Strophostyles helvola* (L.) Ell.
- 232. ²*Trifolium arvense* L.
- 233. ²*T. pratense* L.
- 234. ²*T. procumbens* L.
- 235. ²*T. repens* L.

Oxalidaceae

236. ²*Oxalis corniculata* L.
237. *O. europaea* Jord.

Geraniaceae

238. *Geranium maculatum* L.

Simaroubaceae

239. ²*Ailanthus altissima* (Mill.) Swingle

Polygalaceae

240. ⁴*Polygala verticillata* L. var. *ambigua* (Nutt.) Wood

Euphorbiaceae

241. *Euphorbia polygonifolia* L.
242. *E. supina* Raf.

Callitrichaceae

243. *Callitriche verna* L.

Anacardiaceae

244. *Rhus copallina* L.
245. *R. glabra* L.
246. *R. typhina* L.
247. *Toxicodendron radicans* (L.) Kuntze

Aquifoliaceae

248. *Ilex verticillata* (L.) Gray

Celastraceae

249. ²*Celastrus orbiculatus* Thunb.

Aceraceae

250. ²*Acer pseudoplatanus* L.
251. ⁴*A. rubrum* L.

Hippocastanaceae

- ^{2,3}*Aesculus hippocastanum* L.

Balsaminaceae

252. ⁴*Impatiens capensis* Meerb.

Vitaceae

253. *Parthenocissus vitacea* (Knerr) Hitchc.
254. *Vitis labrusca* L.

Malvaceae

255. *Hibiscus palustris* L.
256. *H. palustris* L. f. *peckii* House
^{2,3}*H. syriacus* L.

Guttiferae

- 257. *Hypericum boreale* (Britt.) Bickn.
- 258. *H. boreale* (Britt.) Bickn. f. *callitrichoides* Fassett
- 259. *H. gentianoides* (L.) BSP.
- 260. *H. mutilum* L.
- 261. ²*H. perforatum* L.
- 262. *H. virginicum* L.

Elatinaceae

- 263. *Elatine minima* (Nutt.) Fisch. & Mey.

Cistaceae

- 264. ⁴*Hudsonia tomentosa* Nutt.
- 265. *Lechea maritima* Leggett

Violaceae

- 266. *Viola cucullata* Ait.
- 267. *V. fimbriatula* Sm.
- 268. *V. macloskyi* Lloyd ssp. *pallens* (Banks) Baker

Cactaceae

- 269. *Opuntia humifusa* Raf.

Lythraceae

- 270. *Decodon verticillatus* (L.) Ell.

Nyssaceae

- 271. *Nyssa sylvatica* Marsh.

Onagraceae

- 272. *Circaea quadrisulcata* (Maxim.) Franch. & Sav. var. *canadensis* (L.) Hara
- 273. *Epilobium coloratum* Biehler
- 274. *Ludwigia palustris* (L.) Ell. var. *americana* (DC.) Fern. & Grise.
- 275. *Oenothera biennis* L.

Haloragaceae

- 276. ¹*Myriophyllum humile* (Raf.) Morong
- 277. *M. humile* (Raf.) Morong f. *capillaceum* (Torr.) Fern.
- 278. *Proserpinaca palustris* L.

Umbelliferae

- 279. ²*Daucus carota* L.
- 280. *Heracleum maximum* Bartr.
- 281. *Ptilimnium capillaceum* (Michx.) Raf.
- 282. *Sanicula canadensis* L.

Cornaceae

- 283. ¹*Cornus alternifolia* L. f.
- 284. *C. florida* L.

Clethraceae

- 285. *Clethra alnifolia* L.

Ericaceae

- 286. *Gaylussacia baccata* (Wang.) K. Koch.
- 287. *Vaccinium angustifolium* Ait. var. *laevifolium* House
- 288. *V. atrococcum* (Gray) Heller
- 289. *V. corymbosum* L.

Primulaceae

- 290. ²*Anagallis arvensis* L.
- 291. *Hottonia inflata* Ell.
- 292. ¹*Lysimachia ciliata* L.

Plumbaginaceae

- 292. *Limonium carolinianum* (Walt.) Britt.

Asclepiadaceae

- 294. *Asclepias incarnata* L. var. *pulchra* (Ehrh.) Pers.
- 295. ⁴*A. purpurascens* L.
- 296. *A. syriaca* L.
- 297. *A. tuberosa* L.

Convolvulaceae

- 298. *Convolvulus sepium* L.
- 299. *Cuscuta gronovii* Willd.

Boraginaceae

- 300. ⁴*Hackelia virginiana* (L.) I. M. Johnston
- 301. ⁴*Myosotis laxa* Lehm.

Verbenaceae

- 302. *Verbena hastata* L.

Labiatae

- 303. ¹*Collinsonia canadensis* L.
- 304. *Lycopus americanus* Muhl.
- 305. *L. virginicus* L.
- 306. ²*Nepeta cataria* L.
- 307. *Prunella vulgaris* L.
- 308. *Pycnanthemum muticum* (Michx.) Pers.
- 309. ⁴*P. tenuifolium* Schrad.
- 310. ⁴*Satureja vulgaris* (L.) Fritsch var. *neogaea* Fern.
- 311. *Scutellaria epilobifolia* A. Hamilton
- 312. *S. lateriflora* L.
- 313. ¹*Stachys hyssopifolia* Michx.
- 314. *Teucrium canadense* L.

Solanaceae

- 315. ²*Datura stramonium* L. var. *tatula* (L.) Torr.
- 316. *Solanum carolinense* L.
- 317. ²*S. nigrum* L.

Scrophulariaceae

- 318. *Gerardia maritima* Raf.
- 319. *Gratiola aurea* Muhl.
- 320. *Linaria canadensis* (L.) Dumont
- 321. ²*L. vulgaris* Hill.
- 322. *Lindernia anagallidea* (Michx.) Pennell
- 323. ²*Paulownia tomentosa* (Thunb.) Steud.
- 324. *Scrophularia lanceolata* Pursh
- 325. ²*Verbascum thapsus* L.
- 326. ²*Veronica serpyllifolia* L.
- 327. *V. tenella* All.

Bignoniaceae

- 328. ²*Catalpa bignonioides* Walt.

Orobanchaceae

- 329. *Epifagus virginiana* (L.) Bart.

Phrymaceae

- 330. ¹*Phryma leptostachya* L.

Plantaginaceae

- 331. *Plantago aristata* Michx.
- 332. ²*P. lanceolata* L.
- 333. *P. major* L. var. *scopulorum* Fries & Broberg
- 334. *P. oliganthos* R. & S.

Rubiaceae

- 335. *Cephalanthus occidentalis* L.
- 336. *Galium aparine* L.
- 337. *G. palustre* L.
- 338. *G. tinctorium* L.
- 339. *G. triflorum* Michx.

Caprifoliaceae

- 340. ²*Lonicera japonica* Thunb.
- 341. *Sambucus canadensis* L.
- 342. *Viburnum recognitum* Fern.

Campanulaceae

- 343. *Lobelia inflata* L.

Compositae

- 344. ²*Achillea millefolium* L.
- 345. *Ambrosia artemisiifolia* L.
- 346. *Anaphalis margaritacea* (L.) C. B. Clarke var. *intercedens* Hara
- 347. *Antennaria neglecta* Greene
- 348. ²*Anthemus cotula* L.
- 349. ²*Artemisia stelleriana* Bess.

Compositae (continued)

350. *Aster divaricatus* L.
 351. *A. dumosus* L.
 352. ¹*A. novae-angliae* L.
 353. ⁴*A. vimineus* Lam.
 354. *Baccharis halimifolia* L.
 355. *Bidens cernua* L.
 356. *B. connata* Muhl. var. *petiolata* (Nutt.) Farw.
 357. *B. frondosa* L.
 358. ²*Chrysanthemum leucanthemum* L. var. *pinnatifidum* Lecoq & Lamotte
 359. *Chrysopsis falcata* (Pursh) Ell.
 360. ²*Cichorium intybus* L.
 361. *Cirsium altissimum* (L.) Spreng.
 362. ²*C. arvense* (L.) Scop.
 363. *C. discolor* (Muhl.) Spreng.
 364. *C. horridulum* Michx.
 365. ¹*C. muticum* Michx.
 366. *C. pumilum* (Nutt.) Spreng.
 367. ²*C. vulgare* (Savi) Tenore
 368. *Erechtites hieracifolia* (L.) Raf.
 369. *Erigeron pusillus* Nutt.
 370. *E. strigosus* Muhl.
 371. *Eupatorium hyssopifolium* L.
 372. *Gnaphalium obtusifolium* L.
 373. *G. uliginosum* L.
 374. *Helenium flexuosum* Raf.
 375. *Hieracium gronovii* L.
 376. ²*H. praealtum* Gochnat var. *decipiens* W. D. J. Koch
 377. ²*Hypochoeris radicata* L.
 378. *Iva frutescens* L. var. *oraria* (Bartlett) Fern.
 379. ²*Lactuca scariola* L. f. *integrifolia* (Bogenh.) G. Beck
 380. ²*Matricaria matricarioides* (Less.) Porter
 381. ⁴*Mikania scandens* (L.) Willd.
 382. ^{2,4}*Onopordum acanthium* L.
 383. *Pluchea purpurascens* (Sw.) DC. var. *succulenta* Fern.
 384. *Prenanthes trifoliolata* (Cass.) Fern.
 385. *Rudbeckia hirta* L.
 386. *Solidago nemoralis* Ait.
 387. *S. rugosa* Ait.
 388. *S. sempervirens* L.
 389. *S. tenuifolia* Pursh
 390. ²*Sonchus asper* (L.) Hill
 391. ²*Taraxacum officinale* Weber
 392. *Xanthium echinatum* Murr.
 393. ^{1,2}*X. spinosum* L.